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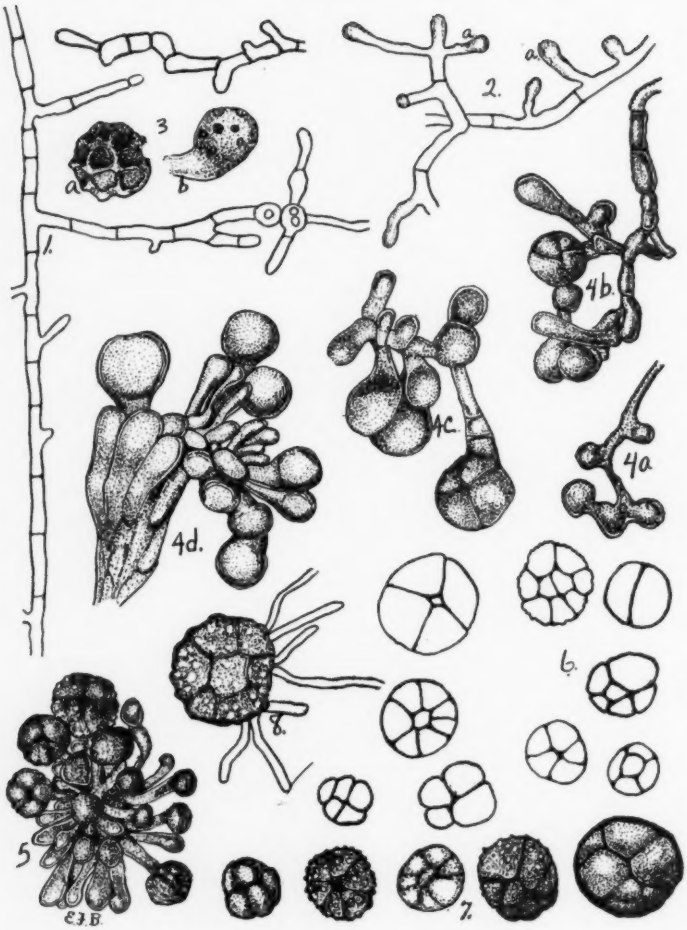


THYROCOCCUM HUMICOLA BUCHANAN

# MYCOLOGIA

VOL. III JANUARY, 1911 NO. 1

## A NEW SPECIES OF THYROCOCCUM

R. E. BUCHANAN

(WITH PLATES 34 AND 35, CONTAINING 10 FIGURES)

The isolation in pure cultures of a hyphomycete at first referred to the genus *Epicoccum* has recently afforded an opportunity for a study of this form. It has been found on several occasions growing on dextrose, nitrogen-free, agar plates prepared from dilutions of a black loam soil rich in humus. The life history of the members of this genus, particularly the development and septation of the spores, seems to be imperfectly understood.

The genus *Epicoccum* Link is characterized by its dark, unicellular (or rarely multicellular) spores, borne singly on conidiophores massed in a dense sporodochium. The septation of the spores is not easily observed, and doubt has been expressed as to whether these so-called septa are not merely superficial markings. Lindau (Rabenhorst's Krypt. Flora **9**: 595. 1909) says: "v. Höhnel hat vorgeschlagen, die Gattung zu Teilen und die Arten mit einzelligen Konidien bei *Epicoccum* zu belassen, und die mit mehrzelligen Konidien zu Thyrococcum zu stellen. . . . Wir wissen nämlich nicht ob die einzelligen Konidien sich nicht doch später noch teilen. Ferner kennen wir die Art der Teilung der Konidien nur bei wenigen Arten genauer und auch hier bleibt noch eine gewisse Unsichbarkeit zurück. Sie liese nur damit haben, dass man die Keimung der Konidien beobachtet, um dadurch zu sehen, ob wir es mit einem Konglomerat von Konidien

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oder mit einer einheitlichen Konidie zu tun haben. . . . Diese Schwierigkeiten könnten nur durch eine genaue Untersuchung der Konidienbildung und -teilung behoben werden."

The mycelium of this organism develops readily in a variety of media, most luxuriantly in those containing dextrose. Mannite N free agar, dextrose, starch and mannite N free nutrient solutions, solidified blood serum, dextrose and peptone gelatin, and peptone solutions all support good growths. The hyphae are much branched, and cross and recross in every direction. For the most part, they remain near the surface of the medium, the organism being a strict aërobe. The hyphae vary considerably in diameter, from 3 to 8 $\mu$. They are septate and usually granular. The mycelial threads lying in the medium are hyaline and colorless, at least when young; from them is diffused a pigment, which is brown in dextrose and lemon-yellow and later brown in mannite media. This pigment is soluble in alcohol and in water. Aërial hyphae are developed in considerable numbers. In the absence of an excess of moisture, these produce the sporodochia and the spores; in a saturated atmosphere, they form pink or brown masses of hyphae several millimeters in diameter. The hyphae lying in the medium show marked antibiosis toward the hyphae of certain species of *Penicillium* and some other molds.

The sporodochia arise from the aërial hyphae. Certain threads branch and rebranch to form a dense mass, or sporodochium, from which the conidiophores develop. The tips of the latter become fuscous and swell to form the spores. The conidiophores are from 5 to 25 $\mu$ in length, and septate when long. The spore is not readily broken off. These sporodochia are usually spherical or ovoid and vary in diameter when mature from 50 to 500 $\mu$. The young sporodochia may be early recognized by the fuscous tips of the branches of the aërial hyphae.

The sporodochia and spores are not developed readily in a saturated atmosphere. A thick layer of agar, for example, in the bottom of a Petri dish will prevent the formation of spores, although under these conditions there may be an abundant production of aërial hyphae. If the cover of such a plate be removed and the surface of the medium allowed to dry somewhat,

the beginnings of sporodochia may be found in great abundance within twenty-four hours.

The spores are spherical, rarely becoming somewhat irregular by the distension of one or more cells. They are 10–25 $\mu$, usually about 20 $\mu$, in diameter, brown when young, when mature opaque, shining, coal-black, and waxy. The mature spores are multi-septate. The septa begin to appear when the spore is two thirds grown, but the mature spores are too opaque to reveal the internal structure readily, although in a few individuals the septa may be seen. There can be no doubt of their septate character after an examination of Plate 34, figures 4 to 7, and particularly Plate 35, figure 2, which illustrates the many tubes which issue from a germinating spore. As suggested by Lindau in the quotation above, we may refer this species to the genus *Thyrococcum* rather than *Epicoccum* on the basis of the septation of its spores. It is possible that several other species with occasionally septate spores that have been described as *Epicoccum* belong to *Thyrococcum*. The septa in some cases radiate from the center and give the spore the appearance of a musk-melon with longitudinal grooves. More frequently, however, they are placed irregularly. The surface of the spore is areolate and somewhat tuberculate. A diagnosis of the species follows.

**Thyrococcum humicola** sp. nov.

Hyphis sterilibus, decumbentibus vel assurgentibus, in agar hyalinis, in aere fuscis, roseis vel brunneis, multis ramosis, septatis; sporodochiis orbicularis sparse gregariis vel separatis, raris confluentibus, 50 to 500 $\mu$ diam., fuscis; conidiis, sphaericis vel raris irregularis, multo-septatis, dictyosporis, 10–25 $\mu$ in diam. non stipitatis, reticulatis, verrucosis, primo atrobrunneis denique nigris.

Hab. in dextrose agar pulvere terrae humosae infecta.

BACTERIOLOGICAL LABORATORY,
IOWA STATE COLLEGE, AMES, IOWA

EXPLANATION OF PLATE 34 (frontispiece)

1. Mycelium grown on dextrose agar plate. × 1000.

2. Aerial mycelium showing the fuscous tips of the branches, the beginning of a sporodochium. × 1000.

3. Young spores. × 1000.

4. Young sporodochia in various stages of development. × 1000.

5. Young sporodochium. × 1000.

6. Outlines of spores, showing variety of septation. × 800.

7. Spores, matured, showing septa. The distinctness of the walls is somewhat exaggerated. × 800.

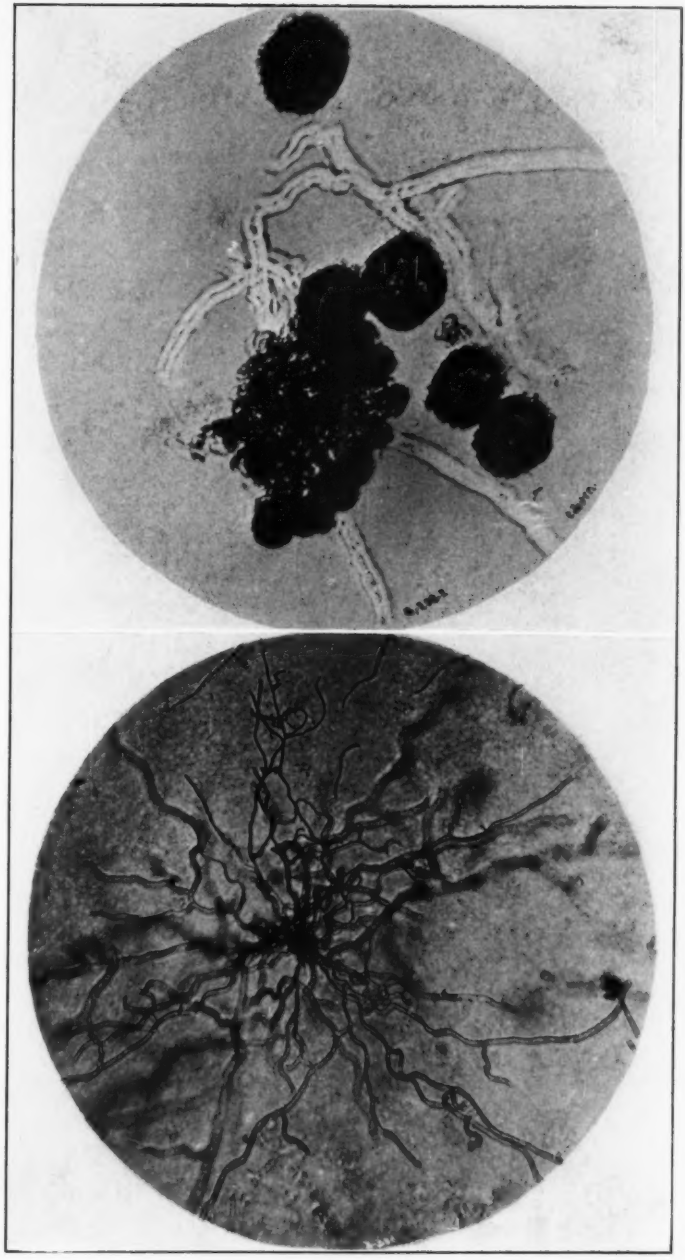
8. Germinating spores, showing the hyphae originating from several cells. × 800.

EXPLANATION OF PLATE 35

1. Microphotograph of young sporodochium on aërial hyphae. Some of the spores may be seen to be septate. On dextrose N-free agar. × 1000.

2. Microphotograph of single germinating spore. Note that the hyphae originate from many points on the surface. Higher magnification shows the spore to be multiseptate and hyphae originate from different cells, frequently several from a single cell. × 400.

This plate is reproduced by courtesy of the Iowa Agricultural Experiment Station.



THYROCOCCUM HUMICOLA BUCHANAN

# NEW SPECIES OF TEXAS FUNGI

F. D. Heald and F. A. Wolf

In the spring of 1909, the writers, in cooperation with the Bureau of Plant Industry, of the United States Department of Agriculture, began a Plant Disease Survey of the area designated as the San Antonio-Austin area. This area included the territory within a radius of one hundred miles of San Antonio, and collections were made at many points.

Parasitic species occurring on both wild and economic plants were collected, but attention was given chiefly to cultivated crops. As a result of this work, forty-one new species have been described and a total of two hundred and ninety-three species, on one hundred and ninety-three different hosts, have been recorded. They are distributed as follows:

| | Species |
|---|---|
| On tree fruits | 30 |
| On small fruits | 7 |
| On truck crops | 33 |
| On cereals and field crops | 13 |
| On forage crops and grasses | 25 |
| On trees and shrubs | 90 |
| On greenhouse and garden plants | 27 |
| On wild plants | 68 |

The complete report of the Plant Disease Survey is being published as a bulletin by the United States Department of Agriculture, and will contain figures illustrating practically all of the new species, descriptions of which are published here.

### Dimerosporium Parkinsoniae

Myceliis effusis, brunneis, septatis, ramosis; conidiis atrobrunneis, 1–4 loculis, muraliformibus; perithecis gregariis, atris, subglobosis, ascis 8-sporiis, 45–50 × 12–15 μ. sporidiis hyalinis, inaequaliter biloculis, guttulatis, 15–18 × 4–6 μ.

On *Parkinsonia aculeata* L. Austin, *455;* Seguin, *2311 (type)*; Gonzales, *2658;* Hallettsville, *2901.*

The leaves and smaller twigs and even the smooth bark of larger branches are sometimes covered with sooty patches made up of dense aggregates of the brown septate hyphae.

**Phleospora multimaculans**

Maculis numerosis, definitis, irregularibus, orbicularibus v. angulatis, atro-brunneis vel purpurascentibus, 1–3 mm. diam. confluentibus, saepe partem majorem foliorum insidientibus; pycnidiis hypophyllis 30–45 $\mu$ diam.; sporulis cylindraceis, rectis curvulisve, 1–4-septatis, hyalinis, 20–50 $\times$ 3.5–5 $\mu$.

On *Platanus occidentalis* L. Austin, *1398, 1535;* Brenham, *1462;* New Braunfels, *1682* (*type*); Llano, *1767;* Victoria, *2503;* Gonzales, *2655;* Floresville, *2558.* On *Juglans nigra* L. Austin, *1538, 2426;* Victoria, *2337;* Stockdale, *2621;* Gonzales, *2682;* Flatonia, *2721;* Falfurrias, *2460.* On *Juglans regia* L. Austin, *366;* Falfurrias, *2461.*

On the sycamore, definite, irregular, circular or angular spots, dark-brown or purple, and 1–3 mm. in diameter are produced on the upper surface of the living leaves. They frequently show a brown center and the under surface of the spot is brown throughout with a darker brown border. The spots frequently become confluent and produce dirty-brown extended areas. The spots may be very numerous and in nurseries much defoliation results.

On the walnut, this fungus produces subcircular spots 1 mm. in diameter, dark-brown with a darker border on the upper surface and uniformly brown on the under surface. The spots may be few in number or they may be so numerous as to almost completely cover the leaf. It is very severe in some cases and causes much defoliation.

**Phleospora adusta**

Areis initio marginalis dein effusis, irregularibus, brunneis, folium totum arescentibus adurentibusque; pycnidiis hypophyllis, sparsis, 30–50 $\mu$ diam.; sporulis cylindraceis, 1–3-septatis, hyalinis, 18–36 $\times$ 3–3.5 $\mu$.

On living leaves of *Clematis Drummondii* T. & G. New Braunfels, *1699;* Austin, *1726* (*type*); Llano, *1734;* Beeville,

*1833;* Sabinal, *1976;* Hondo, *1998;* Bastrop, *2021;* Seguin, *2303;* Georgetown, *2390;* Gonzales, *2654;* Kennedy, *2825.*

This leaf blight is very general and very severe. The foliage comes to have large, irregular, brown areas, generally beginning on the leaf tips. The entire leaf becomes dry, brown, and more or less curled in the advanced stages of the disease.

**Phyllosticta biformis**

Maculis orbicularibus, 2–5 mm. lat., griseis, atro-marginis; pycnidiis in foliis globosis ac in fructibus lenticularibus ostiolatis, 150 $\mu$ diam. Sporulis copiosis, granuloso farctis, hyalinis, 6–9 $\mu$.

On *Diospyros texana* Scheele. Llano, *1789;* Austin, *1548, 2896* (*type*).

The Mexican persimmon is affected by this fungus, which produces black pycnidia in clusters upon the upper surface of the leaves. At first they are surrounded by the green tissue but later a dark-margined spot 2–5 mm. in diameter is formed, which is grayish, with the black pycnidia distinctly visible. The pycnidia show on the fruit as minute pustules on slightly sunken spots, but are not very evident on account of the dark color of the fruit.

The pycnidia on the leaves are globose, ostiolate, and produce an abundance of hyaline, densely granular spores; the pycnidia on the fruit are much more flattened, and are covered by the very thick epidermal wall, but contain spores similar to those on the leaf except that they are dilutely brown in color.

**Phyllosticta bumeliifolia**

Maculis solitariis saepe confluentibus definitis, pallide brunneis, inferne pallidioribus, 3–6 mm. diam.; pycnidiis innatis, epiphyllis, nigris, 125–150 $\mu$; sporulis globosis, granulosis, guttulatis, 9–15 $\mu$ diam.

On *Bumelia lanuginosa* Pers. Austin, *1549* (*type*), *3032.*

This fungus causes the formation of pale-brown spots on the living leaves. These spots vary in diameter from 3–6 mm. when circular or subcircular, but often the areas have fused so that much larger irregular spots are produced. The color is less

intense on the lower surface. Numerous black pycnidia open to the upper surface. In severe cases half of the leaf tissue may be involved.

**Phyllosticta congesta**

Maculis minutis, .5–.8 mm. diam., brunneis numerosis, venis limitatis; pycnidiis solitaris in quaque area, 50–125 $\mu$ diam.; sporulis globulosis vel leniter elongatis, hyalinis, 6–9 $\mu$.

On *Prunus* sp. Boerne, *1554* (*type*).

On the upper surface of the leaf are very numerous brown areolae bounded by the veins of the leaf. The lower surface may not be discolored. These minute spots fuse, and each contains at its center a single black pycnidium. The pycnidia contain globular or slightly oval, clear spores.

**Phyllosticta Verbesinae**

Maculis numerosis, griseis, suborbicularibus zona atrofusca cinctis, 1–3 mm. diam.; pycnidiis epiphyllis, 36–45 $\mu$; sporulis oblongis vel ellipticis 4–6 $\times$ 2.5–3 $\mu$.

On *Verbesina texana* Buckl. Seguin, *2310* (*type*).

This fungus produces gray or whitish subcircular spots, 1–3 mm. in diameter, surrounded by an indefinite darker zone which fades out into the green tissue.

**Septoria marginata**

Maculis marginalis, effusis, dilute brunneis v. stramineis; peritheciis numerosis, amphigenis, brunneis vel nigris, 87–140 $\mu$; poro leniter pertusis, sporulis hyalinis, rectis saepe curvulis, septatis, 40–60 $\times$ 2.5–3 $\mu$.

On *Rulac texana* (Pax.) Small. Beeville, *1859;* Lockhart, *2060;* San Marcos, *2113* (*type*); Luling, *2279;* Seguin, *2286.*

The tips and margins of the leaves are killed, the dead areas being brick-red, light-brown, or straw-colored, or nearly gray in some cases, and confined to a narrow zone at the leaf tip or margin or extending back until the whole leaflet is involved. The advancing edge of the affected area is bordered by a narrow zone of yellow. The disease results in a considerable amount of defoliation with the appearance of having suffered from drought.

The spore measurements are identical in size with *Cylindro-*

*sporium Negundinis* Ell. & Ev., and the fungus was first referred to this species by the writers, since the extrusion of the spores from the pycnidia simulated acervuli in external appearance. It is possible that the two are identical.

**Septoria Jatrophae**

Maculis variis, 1–5 mm. latis, orbicularibus, interdum irregularibus, primo atro-brunneis, margine atro circumdatis, demum centro fulvescentibus vel saepe griseolis, confluentibus, partem majorem foliorum arescentibus; pycnidiis omnino immersis, brunneis, 120–150 $\mu$; sporulis bacillaribus v. leniter clavatis, septatis hyalinis, 40–50 $\times$ 3 $\mu$.

On *Jatropha stimulosa* Michx. Austin, *2429 (type)*.

The species causes the formation of very characteristic, brown, circular areas on the leaves. The spots vary in size from 1–5 mm., and are frequently somewhat irregular in outline. At first, they are dark-brown with a darker, almost black border; later, the centers become tan and sometimes gray but always have a definite dark margin. The spots are frequently so abundant that they fuse, causing the drying of large portions of the leaf.

**Septoria pertusa**

Amphigenis; maculis magnis, 1–2 cm., indefinitis, brunneolis, fulvo-marginatis, dein margine pallescentibus, confluentibus; peritheciis innatis, fuscis, ostiolo amplo pertusis; sporulis hyalinis, rectis vel leniter curvulis, leniter clavatis, guttulatis, 60–75 $\times$ 3 $\mu$.

On *Sorghum halapense* L. Luling, *2270;* Flatonia, *2722 (type)*.

The diseased areas are elongated parallel to the veins and 1–2 cm. in length, without a definite margin. The brownish center is surrounded by a yellow zone which pales out into the green. These areas become confluent, so that entire leaves may become dry and yellowish-brown in color. The flask-shaped pycnidia are very abundant on both surfaces and protrude by a short papilla. The conidia are extruded so abundantly as to make a white coating.

**Stagonospora gigantea**

Areis marginalis plerumque apice foliorum arescentibus, griseolis, zonatis; pycnidiis initio subcutaneis, dein erumpentibus,

atris, 500–600 μ diam.; conidiis magnis, hyalinis, dense granulosis, interdum guttulatis, cylindraceis v. leniter clavatis, 3-septatis, 72–115 × 13–15 μ.

On living leaves of *Agave Americana* L. Austin, *1283* (*type*); San Antonio, *1377;* Boerne, *1648.*

The blight begins at the tips or margins of the leaves and advances toward the base. The diseased tissue becomes dry, gray, and zonate, marking the periodic growth of the fungus. The pycnidia are on both leaf surfaces, covered at first and at length protruding. Our species differs from *S. macrospora* (Dur. & Mont.) Sacc. in having much larger spores and also larger pycnidia. This disease has been very serious, blighting the plants in all the localities where it was observed.

**Colletotrichum caulicolum**

Acervulis sparsis, nigris, lenticularibus, 150–250 μ. Setis copiosis, brunneis, septatis, utrimque rotundatis vel superne acutis, 60–120 × 3.5–4 μ; basidiis 30–60 μ, cylindraceis, hyalinis, plerumque 1–2-septatis; conidiis falcatis, hyalinis, granulosis, 18–30 × 3.5–4 μ.

On living stems of *Phaseolus vulgaris* L. Uvalde, *1963* (*type*).

A destructive disease of the Kentucky Wonder bean, observed in a single locality, was found to be due to this fungus. A superficial examination of the affected field showed a considerable number of plants which were completely dead, others were dying, while still others that were less affected exhibited more or less chlorosis of the foliage. An examination of the root system showed it to be in normal condition, while the only deviation from the normal in the foliage was the marked chlorosis.

An examination of the stems showed that brown, depressed cankers were present an inch or more above the ground level. The cankers were longitudinally elongated (2–4 cm.), more or less irregular, rough and somewhat fissured or open. On the chlorotic plants the canker occupied one side of the stem, on the plants that were dying the stem was nearly girdled, and on all dead plants examined the canker had completely encircled the stem.

The acervuli do not occur on the young cankers, but nearly mature or complete cankers show a few which are visible to the naked eye as small black specks, while they become much more abundant on the stems of plants which have been dead for a few days.

**Colletotrichum griseum**

Areis initio indefinite marginatis, flavidis dein definitis, margine brunneo elevato, centro griseis, 8–10 mm. latis; acervulis zonatis vel sparsis, primo tectis, globulosis vel lenticularibus, 250 $\mu$ diam.; setis numerosis, brunneis, cylindraceis, saepe superne attenuatis, 40–60 $\times$ 5 $\mu$; conidiis rectis vel leniter curvulis, granulosis, guttulatis, hyalinis, raro inaequaliter 1-septatis, 14–17 $\times$ 4 $\mu$.

On leaves and branches of *Euonymus japonicus* Thunb. Austin, *1280 (type)*; San Antonio, *1404;* Lockhart, *2110;* Georgetown, *2363, 2375, 2376.*

This is one of the most common diseases of the Chinese box for this region. It forms on the leaves indefinite-margined, yellow blotches 1–4 mm. in diameter. These increase in size until the diseased areas are sometimes 8–10 mm. across, and a definite brown elevated border is formed, when the center of the spot becomes gray. Scattered over this gray area are numerous black acervuli either zonate or more or less scattered, usually concentrically arranged. Often the spots are marginal or the disease may even apparently work back from the tip of the leaf. The twigs and larger branches are also affected, resulting in the formation of gray cankers 1–8 mm. in diameter. These gray patches drop away, leaving the brown cankered area exposed.

**Cylindrosporium defoliatum**

Areis irregularibus, griseolis, initio 1–2 cm. diam., confluentibus, saepe partem majorem foliorum occupantibus; acervulis amphigenis, plerumque epiphyllis; conidiis cylindraceis, hyalinis, 30–42 $\times$ 3–3.5 $\mu$, 3–5-septatis.

On *Celtis mississippiensis* Bosc. New Braunfels, *1673;* Austin, *1728, 1905 (type)*; Beeville, *1855;* Elgin, *1890;* Bastrop, *2049;* Lockhart, *2073;* San Marcos, *2099;* Cotulla, *2180;* Luling, *2256;* Seguin, *2317;* Georgetown, *2377;* Victoria, *2509;* Cuero, *2578;* Stockdale, *2615;* Gonzales, *2689;* Flatonia, *2709;* Yoakum, *2771.* On *Celtis reticulata* Sarg. Sabinal, *1975.*

The common hackberry of this region, *Celtis mississippiensis,* is quite generally affected with a serious leaf blight which first produces irregular gray blotches 1–2 cm. in diameter. These blotches sometimes coalesce and involve a large part of the leaf. In early stages of the disease the adjacent tissue may remain green, but later a considerable amount of yellowing is produced and the affected leaves fall from the tree. The acervuli are amphigenous, but more abundant upon the upper surface. The spores are extruded in masses and accumulate on the surface of the leaf where they are visible as minute white tufts. This species is clearly distinct from *Cylindrosporium Celtidis* Earle, which has been described as forming small spots on *Celtis mississippiensis* in Alabama.

**Cylindrosporium griseum**

Maculis variis, numerosis, orbicularibus vel leniter angulatis, 1–5 mm. latis plerumque 1–2 mm., saepe confluentibus; acervulis amphigenis, in venis, orbicularibus vel elongatis, maturitate atris; conidiis cylindraceis, leniter curvulis, hyalinis, 7–9-septatis, 90–135 × 3–4.5 μ.

On leaves of *Sapindus marginatus* Willd. Kerrville, *1588;* Llano, *1757* (*type*); Bastrop, *2026;* San Marcos, *2098.*

Very numerous grayish or whitish, circular or slightly angular spots are produced on both surfaces of the leaflets and the rachis; and show more prominent veins owing to the shrinking of the tissue. These spots may become confluent and cause extended dead areas. The acervuli are amphigenous, more abundant on the upper surface, and are located immediately over the prominent veins. They may be nearly circular in outline or much elongated along the veins, pale when young and becoming darker with age.

**Cylindrosporium Lippiae**

Maculis 2–3 mm. diam., centro griseolis, margine angusto brunneo cinctis; acervulis amphigenis, plerumque epiphyllis, 30–100 μ diam.; conidiis subcylindraceis, hyalinis, continuis vel 1–3-septatis, 24–54 × 3 μ.

On leaves of *Lippia ligustrina* Britton. Llano, *1756* (*type*).

This fungus produces three or four circular spots on each leaf.

The spots have gray centers, with narrow brown borders edged with a tinge of yellow, and show in the center numerous white conidial tufts.

**Cylindrosporium solitarium**

Maculis numerosis, minutis, .5–1 mm. diam., initio atro-brunneis, deinde centro plus minusve pallescentibus vel albescentibus ac margine angusto viride cinctis; acervulis hypophyllis, initio innatis 1–2 in quaque area; conidiis plerumque leniter curvulis, cylindraceis, hyalinis, 3–6-septatis, 45–60 × 3–4 μ.

On living leaves of *Robinia pseudacacia* L. Austin, *459, 1909 (type)*; Georgetown, *2334*.

This disease is characterized by the presence of minute brown spots upon the leaflets. In the early stages of the disease the leaflets have their normal green color and the spots show as circular areas, which have a pale-brown center and a narrow darker brown border surrounded by a faint zone of chlorotic tissue. As the disease progresses the entire leaflet turns to a bright-yellow color, with the exception of narrow zones of pale-green which persist around the circumference of the brown spots. In this stage the spots show an outer zone of green, a middle zone of dark-brown, and a central area of light-brown or grayish tissue. Affected leaflets may show from one to forty spots and these are generally isolated, although they may be somewhat clustered. The leaflets fall soon after they assume the yellow color, and sometimes even before the complete chlorotic stage has has been reached, and in many cases considerable defoliation results. The disease was observed during the season of 1908 in a much more severe form than during the past season. In all cases it was observed only on nursery trees which were badly crowded. Each spot shows one and occasionally two acervuli, which occupy the middle of the light-brown central area. A straight or curved mass of spores may be seen extruded from the acervulus, which is immersed in the tissue of the under surface.

**Cylindrosporium tenuisporum**

Plerumque hypophyllis, saepe epiphyllis; maculis leniter irregularibus, superne brunneis, centro griseolis, margine angusto flavido cinctis, inferne aequaliter brunneis, 2–10 mm. diam.;

acervulis nigris, minutis; conidiis cylindraceis, hyalinis, continuis, rectis v. leniter curvulis, 15–24 × .75–1 μ.

On leaves of *Ulmus crassifolia* Nutt. Austin, *307* (*type*).

The small-leaved elm is affected by a leaf spot which shows as brown, circular or slightly irregular areas, generally with a gray center and a narrow yellow border. The under surfaces of the spots are more uniformly brown and show minute black specks, the acervuli of the fungus. In a few cases the acervuli may be found on the upper surface.

### Cercospora adusta

Areis magnis, marginalis, atro-brunneis; maculis veteribus adustis, juvenibus dilute brunneis, margine flavida late cinctis; conidiophoris amphigenis, caespitosis, brunneis, septatis, 100–150 × 4–5 μ; conidiis dense granulosis, subhyalinis, pluriseptatis, 85–160 × 3–4 μ.

On leaves of *Ligustrum californicum* Hort. Falfurrias, *2471* (*type*); Floresville, *2851*.

This species forms dark-brown areas involving large spots frequently extending from the tip downward or from the margin inward. Rarely are the spots removed from the margin. The older diseased parts become very dark and the newer brown, with a gradual shading out into the chlorotic tissue.

### Cercospora atricincta

Maculis irregularibus, angulatis, centro griseis, brunneo marginatis, 1–2 mm. diam., interdum 4 mm. diam., late purpureo marginatis; conidiophoris amphigenis, caespitulis minutis, septatis, 45–70 × 3.5–4.5 μ; conidiis dilute brunneis, pluriseptatis, clavatis, 100–200 × 4–4.5 μ.

On leaves of *Zinnia* sp. San Antonio, *1381*, *1660;* Victoria, *2506* (*type*).

This disease, rather common in gardens, is characterized by the presence of irregular, angular, gray spots with a brown border. When the spots are abundant this border is narrow and the spots are small, 1–2 mm. in diameter. When they are few they may be 4 mm. in diameter, with a broad marginal zone of purple or dark-brown.

**Cercospora aurantia**

Maculis atro-brunneis, flavidis cinctis, 6–10 mm. lato; hyphis fertilibus hypophyllis, brunneis, septatis, denticulatis, vel nodulosis; conidiis dilute brunneis, clavatis, pluriseptatis, 75–135 × 4–5 μ.

On *Citrus Aurantium* L. Falfurrias, *2446* (*type*).

This fungus forms large spots, 6–10 mm. in diameter, and suborbicular except when they are marginal. They are dark-brown in color with a lighter brown center and surrounded by a region of yellow which fades out into the green of the leaf. The conidiophores, formed on the lower surface in small groups, show plainly the points of attachment of the conidia.

**Cercospora Capsici**

Maculis rotundatis, 1–7 mm. diam., primo brunneis deinde pallescentibus brunneis, zona flavida cinctis; conidiophoris amphigenis, brunneis, 10–15-fasciculatis, septatis, 30–60 × 4.5–5.5 μ. Conidiis plerumque rectis, clavatis, dilute brunneis, septatis paucis, 75–125 × 4–5 μ.

On *Capsicum annuum* L. Cuero, *2592* (*type*).

Leaves infested with this fungus form spots 1–7 mm. in diameter, mostly circular or subcircular. The spots are raised on the upper surface, brown at first, later becoming grayish-brown. They are margined by a very definite darker zone outside of which is a more or less extended halo of yellow. Where the spots are abundant the leaves become chlorotic, wilt and fall.

**Cercospora Chrysanthemi**

Areis superne elevatis, inferne depressis, 2–10 mm. lat., margine elevata, subcircularibus vel irregularibus, brunneis maturitate griseolis. Conidiophoris amphigenis, dense aggregatis, septatis, 40–75 × 4 μ; conidiis clavatis, pluriseptatis, subhyalinis, 40–120 × 4 μ.

On *Chrysanthemum* sp. San Antonio, *1659* (*type*).

The diseased areas are raised above and sunken below and vary much in size. They have very definite elevated borders, are subcircular or irregular in outline, and brown in color, becoming gray with age. When the spots are abundant, the leaf becomes brown between the diseased areas.

### Cercospora Crataegi

Maculis magnis, atro-brunneis irregularibus, inferne pallidioribus, 5–10 mm. latis; confluentibus quandoque numerosis; conidiophoris dense fasciculatis, continuis, brunneis, 24–30 × 5–6 μ; conidiis clavatis, rectis curvulisve, pluriseptatis, guttulatis, 120–180 × 5–7 μ.

On leaves of *Crataegus* sp. Gonzales, *2697* (*type*).

This fungus causes the formation of large dark-brown, irregular areas from 5–10 mm. or more in diameter. The spots are darker above than below and when as many as 20–25 in number are confluent, involving large areas with chlorotic tissue surrounding them. The upper surface is broken by the numerous brown tufts of conidiophores and conidia.

### Cercospora Elaeagni

Amphigenis; maculis orbicularibus v. suborbicularibus, 1–2 mm. latis, centro griseolis vel brunneolis, margine brunneo definite cinctis, saepe totum folium flavidis: conidiophoris fasciculatis, plerumque epiphyllis, atro-brunneis, 40 × 3.5–4 μ; conidiis septatis, subhyalinis, clavatis, rectis curvulisve, 28–150 × 2.5–4 μ.

On living leaves of *Elaeagnus* sp. Floresville, *2861* (*type*).

When this disease is present the leaves show on the upper surface an abundance of circular or subcircular spots 1–2 mm. in diameter, with a definite brown border and a whitish or brown center. The spots are inconspicuous on the under surface on account of the dense silvery tomentum. There is generally some yellowing beyond the spots and in many cases a pronounced yellowing of the whole leaf.

### Cercospora Fici

Maculis magnis, angulatis, superne brunneis, atro-marginalis, inferne aequaliter flavido-brunneis, 1.5–10 mm. diam. saepe confluentibus; conidiophoris dense fasciculatis, epiphyllis, dilute brunneis, 24 × 4 μ; conidiis clavatis, brunneis, pluriseptatis, 60–180 × 3–4.5 μ.

On a variety of *Ficus Carica*. Victoria, *2501;* Cuero, *2593* (*type*); Gonzales, *2674;* Flatonia, *2711;* Hallettsville, *2784*.

This disease appears late in the summer, forming on the leaves large angular or irregular spots, which are dirty-brown above

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with a darker border, and uniformly yellowish-brown below. The disease was very abundant in several localities, involving half of the leaf surface and causing the leaves to fall.

**Cercospora floricola**

Areis indefinitis, effusis, griseolis vel brunneolis, maturitate atrofuscis, perianthium partem majorem v. totum occupantibus saepe scapum insidientibus; conidiophoris dense fasciculatis brevibus, brunneis, continuis, 30–45 × 5–6 μ; conidiis plerumque rectis, cylindraceis v. leniter clavatis, hyalinis vel pallide brunneis, 1–5-septatis, 18–69 × 5–5.5 μ.

On *Yucca rupicola* Scheele. Austin, *1438 (type)*.

In this disease, elongated grayish or brownish patches are produced which become darker with age and spread over the main scape, the flower pedicels, and the outer divisions of the perianth. The creamy-white outer perianth segments may be completely covered with the conidial tufts, which cause them to be turned nearly black and to shrivel more or less. The fungus may spread over the whole segment from the tip downwards. The perianth divisions may be attacked before the flower opens and the flower bud completely blighted or the flower may expand to full size and open in the normal way but blight completely a little later. In the locality where the disease was prevalent fruit formation did not take place.

**Cercospora fulvella**

Epiphyllis interdum amphigenis; maculis irregularibus, flavido-brunneis, 5–10 mm. diam., confluentibus, areas magnas insidientibus necantibusque, inferne pallidioribus; conidiophoris aggregatis, septatis, 40–150 × 4–5 μ; conidiis clavatis, rectis, 3–4-septatis, pallide brunneis, 40–60 × 4–5 μ.

On leaves of *Verbesina texana* Buckl. Austin, *406 (type)*.

This disease is characterized by the presence of irregular yellowish-brown areas, which sometimes become confluent, causing the death of larger areas. The color is more dilute and the spots are less definite on the under surface of the leaf.

**Cercospora lanuginosa**

Epiphylla; maculis foliorum primo indefinite marginatis, atro-brunneis, deinde 1–3 mm. lata, definita, margine brunnea cinctis,

centro griseolis; conidiophoris dense aggregatis, 15 μ longis; conidiis cylindraceis, leniter clavatis, fumagineis, 3–4-septatis, 45–54 × 4–5 μ.

On *Bumelia lanuginosa* Pers. Luling, *2222* (*type*); Flatonia, *2742*.

This disease first appears as indefinite margined, dark-brown spots on the upper surface of the living leaf. At length these areas become irregular in outline with a definite brown margin and a grayish center. Owing to the woolly coating on the lower surface, the leaf spots show through only faintly as brown areas. Scattered over the upper surface of the spot are very dense clusters of conidiophores.

**Cercospora Lythracearum**

Amphigenis; maculis subcircularibus, indefinite marginatis, superne atro-brunneis, zona flava limitatis, inferne flavo-brunneis, 2–8 mm. diam.; conidiophoris dense aggregatis, pallide brunneis, plerumque epiphyllis, continuis, 15–30 × 3 μ; conidiis clavatis vel subcylindraceis, subhyalinis, 30–56 × 3–3.5 μ, 2–5-septatis.

On *Lagerstroemia indica* L. Austin, *466* (*type*). On *Punica Granatum* L. Beeville, *1829;* Victoria, *2510, 2515;* Cuero, *2589;* Flatonia, *2738;* Falfurrias, *2472*.

On the crape myrtle, circular to subcircular, indefinite margined areas appear on the foliage. These spots are uniformly yellowish-brown below and dark-brown above, with a limiting zone of yellow tissue paling out into the green. On the pomegranate, this fungus produces angular, more or less rounded brown spots with an indefinite margin below.

**Cercospora macromaculans**

Amphigenis; areis magnis 1 cm. lat., brunneis arescentibus, plus minusve irregularibus, centro griseolis, saepe zonatis; conidiophoris dense aggregatis, septatis, atro-brunneis, 60–75 × 6 μ; conidiis clavatis apice gradatim attenuatis, septatis, subhyalinis, 70–187 × 2.8–3 μ.

On *Syringa* sp. Kerrville, *1603* (*type*); Austin, *463, 1910*.

This blight is characterized by the presence of large brown, dead patches, which are more or less irregular and either central or marginal. The center of the spots is frequently gray, and

sometimes an evident zonation is exhibited due to the concentric arrangement of the dark conidial tufts. This blight causes the death of many leaves and much defoliation.

**Cercospora Malachrae**

Maculis orbicularibus vel suborbicularibus 1–4 mm. diam., centro flavido-griseis, purpureo-marginatis; conidiophoris caespitosis, amphigenis nodulosis, apice pallidioribus, 90–120 × 4–5 μ; conidiis clavatis, hyalinis, apice attenuatis, 100–210 × 4–5 μ, pluriseptatis.

On *Malachra capitata* L. Victoria, *2347* (*type*).

Circular or subcircular spots are produced on the living leaves. They have a yellowish-gray center, on which the conidial tufts are evident, surrounded by a dark-purple border. The spots are slightly less pronounced upon the under surface.

The conidiophores are amphigenous, in fascicles of a few to a dozen, brown, with slightly paler tips, nodose extremities, and several septa. This species of *Cercospora* seems to be distinct from the many described for different species of the Mallow family. It agrees most nearly with *C. polymorpha* Bubank.

**Cercospora obscura**

Maculis rotundatis, griseis, zona dilute brunnea circumdatis, 1–2 mm. latis; conidiophoris epiphyllis, fasciculatis 4–7, brunneis, apice hyalinis 50–80 × 4–5 μ; conidiis rectis curvulisve, cylindraceis, 3–4-septatis, dilute brunneis, 40–74 × 3–4 μ.

On living leaves of *Cynara Scolymus* L. Beeville, *1861* (*type*).

The presence of this disease is made manifest by circular, gray spots, which appear on the upper surface of the leaf in great numbers. Each spot has a faint brown border with the tufts of conidiophores on the upper surface. Since the lower surface of the leaf is covered by a silvery tomentum, the spots appear as slightly darker areas.

**Cercospora perniciosa**

Maculis rufo-brunneis, atro-marginalis saepe zonatis, inferne pallidioribus, 3 cm. diam., confluentibus, foliis omnibus occupantibus; conidiophoris dense fasciculatis, hyalinis vel dilute brunneis, 40–50 × 3–4 μ; conidiis clavatis, guttulatis, obscuro septatis, 40–105 × 3–4 μ.

On *Cephalanthus occidentalis* L. Victoria, *2539 (type)*; Austin, *2869*.

When this disease is present the entire foliage of the tree is seriously affected. Isolated spots are about 1 cm. in diameter, and reddish-brown with a darker border. The spots often have narrow rings of this darker brown tissue, rendering them zonate. Most commonly these spots are irregular in outline, as the diseased areas have fused, causing a large part of the leaf to become dry. The lower surface of the spots is much more dilutely colored; on the upper surface, the profusion of conidiophores and conidia render the spots grayish. Where the disease has been observed the trees are almost entirely deprived of their leaves.

**Cercospora Prosopidis**

Maculis irregularibus, angularibus, brunneis, margine angusto atro-brunneo limitatis, initio saepe folii margine insidientibus demum totum folium occupantibus necantibusque; conidiophoris amphigenis, dense aggregatis, aequaliter brunneis, continuis, 18–30 × 3–4 μ; conidiis rectis, brunneolis, cylindraceis v. leniter clavatis, 1-pluriseptatis, 20–70 × 4–5 μ.

On *Prosopis glandulosa* Torr. Uvalde, *1959 (type)*; Luling, *2264;* Gonzales, *2663;* Falfurrias, *2468;* Kennedy, *2824;* Floresville, *2847*.

This disease is characterized by the presence of irregular, angular, brown patches which occupy one side of the midrib of the leaflets or extend across the whole leaflet, and are generally bounded by a narrow brown border. The spots may be either terminal or removed from the apex of the leaflet, and frequently advance until the whole leaflet is killed or drops from the tree. In some cases it is very abundant and causes considerable defoliation. Its greatest development may be found in dense mesquite thickets.

**Cercospora xanthicola**

Maculis numerosis, interdum 400–600 in quoque folio .5–2 mm. lat. (plerumque 1 mm.), centro cini-griseolis vel brunneolis, margine atro-fusco angusto limitatis; conidiophoris amphigenis, 3–8-fasciculatis, apice hyalinis, nodulosis, continuis, raro septatis, 60–100 × 3–3.5 μ; conidiis tenuisimis, clavatis, gradatim attenuatis, apice obscure septatis, subhyalinis, 105–135 × 3 μ saepe 245 μ longis.

On *Xanthium* sp. Luling, *2236;* Georgetown, *2383 (type)*; Nursery, *2567;* Cuero, *2588;* Gonzales, *2705;* Yoakum, *2755;* Hallettsville, *2790;* Kennedy, *2836;* Austin, *2871.*

This fungus produces upon the leaves numerous circular or subcircular spots with dirty-gray or brownish centers surrounded by a narrow darker border. The number of infections on a single leaf may reach as high as 400 to 600, in which case the leaf shows more or less chlorosis, but frequently the spots are less numerous and the leaf shows little or no deviation from the normal color.

**Clasterosporium diffusum**

Maculis indefinite marginatis, amphigenis; irregularibus, aequaliter brunneis, 5–10 mm. diam.; hyphis effusis, prostratis, saepe laxe gregariis atque erectis; conidiis curvulis, clavatis, pluriseptatis, brunneis, 45–135 × 4–5 μ.

On *Hicoria pecan* (Marsh) Britton. Victoria, *2536;* Gonzales, *2695 (type)*; Yoakum, *2770;* Hallettsville, *2783.*

This fungus produces circular or irregular, indefinite margined, brown spots, which are uniformly brown on both surfaces of the leaflets. Dark-brown hyphae run throughout the dead tissue or creep over either surface of the affected area, or are sometimes aggregated to produce clusters of erect conidiophores.

**Helminthosporium giganteum**

Caespitulis sparsis, epiphyllis, maculis stramineis, .5–1 × 1–4 mm., confluentibus; hyphis fertilibus atro-brunneis, plurispetatis, base leniter inflatis, 200–400 × 9–12 μ; conidiis cylindraceis 5-septatis, pallide brunneis, granuloso farctis, 300–315 × 15–21 μ.

On *Capriola Dactylon* (L.) Kuntze. Falfurrias, *2440 (type).*

This disease is charactertized by the presence of numerous yellowish or pale straw-colored spots, longitudinally elongated and with a narrow brown border. The spots are generally absent from the leaf sheath, and when numerous they may become confluent on the lamina and thus cause somewhat extended dead areas.

**Ramularia hedericola**

Maculis magnis, irregularibus, superne griseolo-brunneis, inferne aequaliter brunneolis, margine elevato; hyphis epiphyllis, septatis, 60–120 × 4 μ; conidiis hyalinis, 9–15 × 2.5 μ.

On *Hedera Helix* L. San Marcos, *2130* (*type*).

Large irregular spots, grayish-brown above and brown below, appear on the living leaves. The margin of the diseased area is elevated, with the conidial tufts on the upper surface.

**Ramularia Momordicae**

Maculis initio indefinitis, flavidis, tum demum suborbicularibus, superne flavido-brunneis, plus minusve zonatis, 1–10 mm. diam., inferne margine elevato, atro-brunneis, saepe numerosis, confluentibus, folium totum arescentibus; hyphis caespitosis, brunneis, 30–45 × 4–5 μ; conidiis cylindraceis, hyalinis, 1–5-septatis, 42–65 × 4–5 μ.

On *Momordica balsamina* L. Falfurrias, *2482* (*type*).

In the early stages of this disease the leaves show irregular blotches of yellow, and as it advances there are formed, on the upper side of the leaf, circular to subcircular yellowish-brown areas with a more or less evident zonation. The spots are often so numerous as to be confluent, causing the leaves to curl and become dry. A large amount of defoliation results.

**Exosporium concentricum**

Areis subcircularibus, .5–2 cm. diam.; zonatis, brunneis v. flavidis interdum griseis, zona angusta brunnea cinctis; sporodochiis concentricatis v. sparsis, initio innatis; conidiis clavato-cylindraceis, septatis, subhyalinis, rectis vel leniter curvulis, 25–45 × 2.5–3 μ.

On *Euonymus japonicus* Thunb. San Marcos, *2129;* Georgetown, *2375;* Austin, *2867* (*type*).

This fungus produces on the leaves of the Chinese box circular, zoned areas. The affected leaves may show considerable yellowing beyond the diseased areas and in severe cases much defoliation follows. The sporodochia are at first covered and at length protrude, causing that portion of the leaf to become grayish, because the rupture of the epidermis has admitted the air.

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# THE AGARICACEAE OF TROPICAL NORTH AMERICA—I

WILLIAM A. MURRILL

This series of articles is based upon original studies of fresh specimens in Cuba, Jamaica, and Mexico, supplemented by large collections obtained in many parts of tropical America by Britton, Earle, Underwood, Shafer, Wilson, Brace, M. E. Peck, Small, Harris, C. L. Smith, Broadway, Williams, Howe, Duss, Wright, Mrs. Britton, Mrs. Earle, Miss Marble, and others.

The collections at Kew, Paris, Berlin, Upsala, Stockholm, and Copenhagen have also been examined with special reference to the gill-fungi of our tropics, and representative specimens have been compared with type material wherever it was found. The difficulty of preserving specimens of these plants, the lack of proper field notes, and the meager and scattered attempts previously made to gain any comprehensive knowledge of our tropical gill-fungi have resulted in much confusion of species and many synonyms.

Certain common and easily preserved species will be found in nearly every collection, often under a new name. Variations in these strong, prevailing types, which easily run together when examined in hundreds of specimens in the field, loom to specific proportions in a herbarium several thousand miles distant. It may be argued that these varieties are as distinct as many good species; but such abundant and widely distributed types are a law unto themselves, transcending geographical and varietal bounds in their exuberance and defying all attempts to segregate them at the present stage of their evolution. Every mycologist is acquainted with such specific types in most groups of fungi, and every one knows that they are hopeless, some of them even crossing generic and family lines!

The region here designated as tropical North America includes Mexico south of Zacatecas, Central America, and all of the islands lying between North America and South America, with

the exception of Trinidad. To these must be added the Bermudas, which, although far north of the recognized boundary are rendered tropical by the Gulf Stream and contain a large percentage of West Indian species.

Our present study does not include species occurring in South America, but it has been necessary to examine them because so many are common to the American tropics. The same is true to a less extent of the oriental tropical species, several of which are common to both hemispheres, owing, possibly, to former connections by means of land now submerged.

The gap between temperate and tropical North America is comparatively wide and abrupt, if we except the border species in Mexico and southern Florida, and the few temperate species occurring in the higher mountains in the tropics, where temperate conditions prevail. The tropical collector misses such conspicuous genera as *Russula, Lactaria, Cantharellus, Hygrophorus, Amanita, Amanitopsis, Tricholoma, Entoloma, Cortinarius, Paxillus,* and *Inocybe,* whose species compose such a large share of the gill-fungi met with in our northern woods, and he must become familiar with several new genera and a great many new species that are peculiarly tropical.

## Tribe CHANTERELEAE

This tribe, containing species with plicate hymenium, has been treated in *North American Flora,* volume 9, part 3, the following species being there recorded for tropical America: *Plicatura guadelupensis* (Pat.) Murrill, *Plicatura lateritia* (Berk. & Curt.) Murrill, *Xerotinus martinicensis* (Pat.) Murrill, *Xerotinus Mauryi* (Pat.) Murrill, *Xerotus caribaeus* Fries (doubtful), *Asterophora Clavus* (Schaeff.) Murrill, *Trogia cinerea* Pat., *Chanterel infundibuliformis* (Scop.) Fries, *C. cinnabarinus* Schw., *C. mexicanus* Fries, *Neurophyllum ochraceum* Pat., and *Chlorophyllum viride* (Pat.) Murrill. Since the above was published, the range of a few of these species has been extended by recent explorations, and a change in nomenclature has been found necessary in the two following cases.

**Plicatura obliqua** (Berk. & Curt.)

*Marasmius obliquus* Berk. & Curt. Jour. Linn. Soc. **10**: 299. 1868. (Type from Cuba.)

*Panus Wrightii* Berk. & Curt. Jour. Linn. Soc. **10**: 299. 1868. (Type from Cuba.)

*Lentinus verae-crucis* Berk. &. Curt. Jour. Linn. Soc. **10**: 303. 1868. (Type from Vera Cruz.)

*Xerotus Mauryi* Pat. Bull. Soc. Myc. Fr. **14**: 51. *pl. 7. f. 1.* 1898. (Type from Mexico.)

*Xerotus guadelupensis* Pat. Bull. Soc. Myc. Fr. **15**: 195. 1899. (Type from Guadeloupe.)

*Plicatura guadelupensis* (Pat.) Murrill, N. Am. Fl. **9**: 164. 1910.

Specimens at Kew labeled *Marasmius Emerici* Berk., from the Andaman Islands, resemble this species. Typical specimens at Paris from Brazil, collected by Gaudichaud, are incorrectly named *Xerotus rawakensis* Pers. Recent collections are as follows:

Jamaica, *Earle 581, 428, 429, 432, 225, 447, Murrill 47, 100, 147;* Cuba, *Underwood & Earle 1640;* British Honduras, *M. E. Peck;* New Providence, *E. G. Britton 623, 713, 718.*

**Chloroneuron** nom. nov.

*Chlorophyllum* Murrill, N. Am. Fl. **9**: 172. 1910. Not *Chlorophyllum* Mass. Kew Bull. 135. 1898.

**Chloroneuron viride** (Pat.)

*Neurophyllum viride* Pat. Jour. de Bot. **2**: 406. 1888.

*Chlorophyllum viride* (Pat.) Murrill, N. Am. Fl. **9**: 172. 1910.

Excellent specimens from French Guiana and Martinique are to be seen in Patouillard's herbarium, but the species is evidently rare, as no other collections of it are known.

## Tribe LACTARIEAE

The members of this tribe are practically confined to temperate regions. Seventy-two species of *Lactaria* are listed for North America by Miss Burlingham, and there are probably nearly as many species of *Russula.* Berkeley records a species of *Lactaria* from Cuba, and Duss a species of *Russula* from Guadeloupe, both

unidentifiable. Our collections contain the following species, determined by Miss Burlingham.

LACTARIA INSULSA Fries, Epicr. Myc. 336. 1838

Collected in a moist virgin forest at 5,000 ft. elevation near Jalapa, Mexico, *W. A. & Edna L. Murrill 127*. Pileus depressed, the surface marked with narrow zones varying in tone, as in New York specimens.

LACTARIA SUBDULCIS (Pers.) Fries, Epicr. Myc. 345. 1838

Collected on dead trunks of tree ferns in the Cockpit Country, Jamaica, at 2,000 ft. elevation, *Murrill & Harris 876, 1021*. It is rather difficult to account for the presence of this temperate species in a locality so different from its usual surroundings.

**Russula mexicana** Burlingham sp. nov.

Pileus convex to depressed, 6 cm. broad; surface smooth, dry, pale-red, with inseparable pellicle, striate at the margin; context white, 5 mm. thick at the center, promptly and decidedly acrid in taste; lamellae adnate, equal, white when young, becoming pale-yellow at maturity; spores subglobose, echinulate, pale-yellow, 7–8 $\mu$; stipe stout, cylindric, glabrous, roseus, 4 $\times$ 2 cm.

This species is related to *R. palustris* Peck, described from New York, which differs in its separable pellicle and tardily acrid flesh. The above diagnosis was mainly drawn from the field notes and colored sketch accompanying the specimens.

Type collected near Jalapa, Mexico, on humus under the end of a log in rather open woods, December 12–20, 1910, *W. A. & Edna L. Murrill 160*.

Tribe AGARICEAE

This tribe comprises all the remaining fleshy gill-fungi, or those having the hymenium truly lamellate and the context composed of slender, elongate cells. Earle has recently published in the *Bulletin of the New York Botanical Garden* an exhaustive treatment of the genera of the gill-fungi of North America, with descriptions and keys, to which the student of this group is referred.

In treating the tropical species, I do not consider it necessary to follow the taxonomic sequence strictly, so I shall begin with the old genus *Lentinus,* which contains several very common and conspicuous species, rather than with the groups of small sessile species which naturally precede it.

These conspicuous species of our Tropics, usually regular and centrally stipitate when growing under normal conditions, fall rather easily into three genera, which may be distinguished by means of the following simple key.

| | |
|---|---|
| Veil present, at least in young stages. | 1. LENTODIUM. |
| Veil absent, even in young stages. | |
| Lamellae adnate. | 2. LENTINULA. |
| Lamellae decurrent. | 3. LENTINUS. |

1. LENTODIUM Morgan, Jour. Cinc. Soc. Nat. Hist. **18**: 36. 1895

This genus differs from *Lentinus* in having a veil, which often disappears with age without forming an annulus.

**Lentodium squamosum** (Huds.)

*Agaricus squamosus* Huds. Fl. Angl. **2**: 614. 1778. (Based on Schaeff. Fung. Bav. *pl. 29, 30.*)

*Agaricus squamosus* Schaeff. Fung. Bav. ed. 2. **4**: 15. *pl. 29, 30.* 1800.

*Agaricus lepideus* Fries, Obs. Myc. **1**: 21. 1815.

*Lentinus lepideus* Fries, Syst. Orb. Veg. 78. 1825.

This well-known temperate species, so common in Europe and the United States, and so destructive to railway ties and other structural timbers, especially in the southern states, is evidently not well adapted to extreme tropical conditions. No attempts have been made to cite its European synonyms. *Lentinus annulatus* Earle, described from Nevada, differs mainly in its gigantic size. *Lentinus suffrutescens* Fries, collected by Oersted in Costa Rica, is no doubt an aborted sterile form.

Cuba, *Underwood & Earle 1495, Earle 55, Earle & Murrill 575, Van Herman 249, 177;* Jamaica, *Earle, E. G. Britton 1049;* Porto Rico, *Earle 90;* Mexico, *Murrill 80.*

2. LENTINULA Earle, Bull. N. Y. Bot. Gard. **5**: 416. 1909

In this genus, the lamellae are adnate and the context rather thick and firm.

**Lentinula detonsa** (Fries)

*Lentinus detonsus* Fries, Nova Symb. 38. 1851. (Type from Costa Rica.)

*Lentinus cubensis* Berk. & Curt. Jour. Linn. Soc. **10**: 302. 1868. (Type from Cuba.)

*Lentinus proximus* Berk. & Curt. Jour. Linn. Soc. **10**: 302. 1868. (Type from Cuba.)

*Lentinula cubensis* Earle, Bull. N. Y. Bot. Gard. **5**: 417. 1909.

This species occurs on dead wood in many parts of the West Indies, and also in Costa Rica and Louisiana. The gills are separated from the stipe in all the specimens I have seen, as though torn away by contraction on drying.

Cuba, *Wright;* Guadeloupe, *Duss;* Martinique, *Duss;* St. Vincent, *Elliott;* Porto Rico, *E. G. Britton & D. W. Marble 1213.*

3. LENTINUS Fries, Syst. Orb. Veg. 77. 1825

*Panus* Fries, Epicr. Myc. 396. 1838.

*Pocillaria* (P. Browne) O. Kuntze, Rev. Gen. **2**: 865. 1891.

The fact that the type of the genus *Lentinus* (*L. tuber-regium* Fries) produces its sporophores from a tuberous sclerotium would hardly seem sufficient to segregate this genus from *Pocillaria;* especially in view of the fact that the mycelium of some species of *Pocillaria* tends to assume the sclerotial form when growing in decayed wood mixed with earth, and that this form is found in several widely different groups of fungi, apparently for the purpose of rest and protection until sufficient food can be stored up to insure the production of sporophores.

A few of the tropical American species of this genus have been recently figured in Romell's report of 1901 on the fungi of the Regnell Expedition, and in Earle's paper on Cuban fungi published in the first annual report of the Cuban Experiment Station. Most of them, however, keep well in the dried state, and it is usually possible to restore them to their original form by placing them for a short time in a moist chamber.

1. LENTINUS STRIGOSUS (Schw.) Fries, Syst. Orb. Veg. 77. 1825

*Agaricus crinitus* Schw. Schr. Nat. Ges. Leipzig **1**: 89. 1822. Not *Agaricus crinitus* L. 1753. (Type from Georgia.)

*Agaricus strigosus* Schw. Schr. Nat. Ges. Leipzig **1**: 89. 1822. (Type from North Carolina.)

*Lentinus Lecomtei* Fries, Syst. Orb. Veg. 77. 1825. (Based on *A. crinitus* Schw.)

*Panus rudis* Fries, Epicr. 398. 1838. (Based on *A. hirtus* Secr. 1833.)

*Lentinus sparsibarbis* Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868. (Type from Cuba.)

*Lentinus substrigosus* P. Henn. & Shirai, Engl. Jahrb. **28**: 270. 1900. (Type from Japan.)

This cosmopolitan species is very common on old logs and stumps from Maine to Florida and Texas and throughout tropical America. In Europe, as well as in America, it has received many names, several of which are not listed above. *Agaricus cyathiformis* Schaeff. is by many considered a synonym. *L. chactophorus* Lév., described from Java, is closely related.

2. **Lentinus hirtus** (Fries)

*Agaricus* (*Pleurotus*) *hirtus* Fries, Linnaea **5**: 508. 1830. (Type from Brazil.)

*Panus hirtus* Fries, Epicr. Myc. 398. 1838.

*Lentinus submembranaceus* Berk. Lond. Jour. Bot. **2**: 634. 1843. (Type from Brazil.)

*Agaricus hemispilus* Lév. Ann. Sc. Nat. III. **2**: 168. 1844. (Type from Guadeloupe.)

*Lentinus patulus* Lév. Ann. Sc. Nat. III. **5**: 119. 1846. (Type from Guadeloupe.)

*Lentinus Tanghiniae* Lév. Ann. Sc. Nat. III. **5**: 120. 1846. (Type from Madagascar.)

*Lentinus striatulus* Lév. Ann. Sc. Nat. III. **5**: 120. 1846. (Type from French Guiana.)

*Lentinus Fockei* Miq. Fijd. Wetensch. Amsterdam 188. 1852. (Type from Surinam.)

*Lentinus calvescens* Berk. Hook. Journ. Bot. **8**: 141. 1856. (Type from Brazil.)

*Panus Infundibulum* Berk. & Curt. Proc. Am. Acad. **4**: 121. 1860. (Type from Nicaragua.)

*Panus cubensis* Berk. & Curt. Jour. Linn. Soc. **10**: 300. 1868. (Type from Cuba.)

*Lentinus vellereus* Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868. (Type from Cuba.)

*Lentinus estriatus* Berk. & Br. Jour. Linn. Soc. **14**: 44. 1875. (Type from Ceylon.)

*Agaricus (Clitocybe?) Calyx* Speg. Anal. Soc. Ci. Argent. **16**: 243. 1883. (Type from Brazil.)

*Lentinus (Scleroma) paraguayensis* Speg. Anal. Soc. Ci. Argent. **16**: 275. 1883. (Type from Brazil.)

*Crepidotus lentinoides* Earle, Inform. An. Estaç. Centr. Agron. Cuba **1**: 236. 1906. (Type from Cuba.)

This large and conspicuous species is abundant in the West Indies and the warmer portions of Central America and South America, but it has not been collected, I believe, in the Bahamas, Mexico, or the United States. Its surface may be velvety or glabrous, smooth or striate, according to exposure, weather, age, etc., and these variations occur also in India, Ceylon, Mauritius, Madagascar, and other parts of the oriental Tropics where it is common. To the above list of synonyms, should probably be added *Lentinus Kurzianus* Berk., *L. Thwaitesii* Berk. & Br., and a few other species; while *L. exilis* Kl., *L. praerigidus* Berk., and *L. Rivae* Bres. are very closely related. Discolored specimens from Guadeloupe have been determined as *L. melanophyllus* Lév., an oriental species.

Cuba, *Earle 298, Wilson 1350, Britton & Earle & Wilson 6010, Earle & Murrill 179, Wright;* Haiti, *Nash 148;* Porto Rico, *Earle 41, 72, E. G. Britton & Marble 618, Underwood & Griggs 1001;* Jamaica, *Underwood 1924, Earle 276, E. G. Britton 491;* Grenada, *Broadway;* St. Kitts, *Britton & Cowell 249;* British Honduras, *M. E. Peck;* Montserrat, *Shafer 910;* Brazil, *Weiss & Schmidt.*

3. LENTINUS ALBELLUS Pat. Bull. Soc. Myc. Fr. **15**: 195. 1899

Known from a single collection by Duss in Guadeloupe. Types well preserved, showing points in common both with *Lentinus hirtus* and *Lentodium squamosum.*

4. LENTINUS TUBARIUS Pat. Bull. Soc. Myc. Fr. **15**: 194. 1899

Known from a single collection by Duss in Guadeloupe. Similar to *L. hirtus* in many ways, but rufous in color and containing a large percentage of water, causing the specimens to shrink to one third their size in drying.

5. LENTINUS PYRAMIDATUS Berk. & Curt. Proc. Am. Acad. **4**: 121. 1860

Collected originally in Nicaragua by the U. S. Exploring Expedition, and later in Mexico by C. L. Smith, who labeled it *L. villosus.* During the winter of 1907, Mr. M. E. Peck sent it to me from British Honduras. There are two good pencil sketches of it at Kew, but no specimens.

6. LENTINUS CRINITUS (L.) Fries, Syst. Orb. Veg. 77. 1825

*Agaricus crinitus* L. Sp. Pl. ed. 2. 1644. 1763. (Type from Jamaica.)

*Agaricus Bertieri* Fries, Syst. Myc. **1**: 175. 1821. (Type from Guadeloupe.)

*Lentinus nigripes* Fries; Kl. Linnaea **8**: 479. 1833. (Type from Mauritius.)

*Lentinus villosus* Kl. Linnaea **8**: 479. 1833. (Type from Mauritius.)

*Lentinus stuppeus* Kl. Linnaea **8**: 480. 1833. (Type from Mauritius.)

*Lentinus tener* Kl.; Fries, Syn. Gen. Lent. 6. 1836. (Type from Louisiana, according to Klotsch.)

*Lentinus Swartzii* Berk. Lond. Jour. Bot. **2**: 632. 1843. (Type from Jamaica.)

*Lentinus fumigatus* Lév. Ann. Sc. Nat. III. **5**: 117. 1846. (Type from French Guiana.)

*Lentinus Léveillei* Berk. Trans. Linn. Soc. **20**: 112. 1851. (Type from Surinam.)

*Lentinus nicaraguensis* Berk. & Curt. Proc. Am. Acad. **4**: 121. 1860. (Type from Nicaragua.)

*Lentinus Leprieurii* Mont. Am. Sc. Nat. IV. **1**: 119. 1854. (Type from French Guiana.)

*Lentinus Wrightii* Berk. & Curt. Jour. Linn. Soc. **10**: 300. 1868. (Type from Cuba.)

*Lentinus subcervinus* Berk. & Curt. Jour. Linn. Soc. **10**: 300. 1868. (Type from Cuba.)

*Lentinus rigidulus* Berk. & Curt. Jour. Linn. Soc. **10**: 300. 1868. (Type from Cuba.)

*Lentinus Schomburgkii* Berk.; Sacc. Syll. Fung. **9**: 71. 1891. (Type from British Guiana.)

*Pocillaria vestida* Earle, Inform. An. Estaç. Centr. Agron. Cuba **1**: 231. 1906. (Type from Cuba.)

There are no doubt other synonyms, but these will suffice for the present. *L. zonatus* Lév. has been applied to specimens collected in French Guiana by Leprieur, and *Xerotus reniformis* Mey, and *Xerotus tomentosus* Kl., to plants sent to Fries from Surinam by Wenck. *L. Zeyheri* Berk. is an oriental species nearly allied to the very villose forms.

This species is remarkable for its variations, especially in color and villosity, the extreme development of hairy covering being represented by *L. villosus, L. nigripes, L. stuppeus, Pocillaria vestida,* etc., in the above list. Sometimes the hairs are small and soft; and in most specimens the pileus tends to become bald with age, thus adding to the confusion. The plant is extremely common on exposed logs, having been collected throughout our entire tropical region, as well as in southern Florida, Mississippi, South America, and in the oriental Tropics. Over one hundred different collections have recently been brought to the Garden from tropical America.

7. LENTINUS CHRYSOPEPLUS Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868

The single specimen at Kew is well preserved and appears very distinct. The stipe resembles that of *L. crinitus*, but the pileus is adorned with a thick golden tomentum. The spores are ovoid, pointed at one end, smooth, hyaline, $7 \times 4$–$5\,\mu$.

8. LENTINUS STRIGELLUS Berk. & Curt. Jour. Linn. Soc. **10**: 302. 1868

*Panus (Eupanus) guaraniticus* Speg. Anal. Soc. Ci. Argent. **16**: 275. 1883. (Type from Brazil.)

*Pocillaria simulans* Earle, Inform. An. Estaç. Centr. Agron. Cuba **1**: 232. 1906. (Type from Cuba.)

*Pocillaria Palmeri* Earle, Inform. An. Estaç. Centr. Agron. Cuba **1**: 232. 1906. (Type from Cuba.)

This shapely and well-marked species, described from Cuba, is widely distributed in our region, as the list of specimens given below will indicate. Specimens at Kew labeled *Panus velutipes*, from Sante Comapam, Mexico, belong to this species.

Cuba, *Underwood & Earle 1504, 547, 408, 1515, 602, 435, 603, Shafer 218, 4487, Earle & Murrill 567, 489, 524, Palmer & Riley 597, Earle 80, 364, Wright, Britton & Earle & Gager 6826, 7517;* Porto Rico, *Britton & Cowell 1021, 1051;* Jamaica, *Earle 343, 94, 147, Murrill 201;* Guadeloupe, *Duss;* Cordoba, Mexico, *Sallé 102;* British Honduras, *M. E. Peck;* Panama, *Williams 1147;* Costa Rica, *Hoffmann;* Peru, *Matthews;* Brazil, *Balansa 3372.*

9. **Lentinus graminicola** sp. nov.

Pileus small, regular, funnel-shaped, 2–3 cm. broad, the central depression about 5 mm. wide; surface glabrous, smooth, isabelline; margin fibrillose, concolorous, deflexed on drying: context thin, rigid when dry; lamellae white, of medium breadth and distance apart, unequal, decurrent, edges entire: spores smooth, ovoid, hyaline, $7 \times 4\,\mu$: stipe gradually enlarged above, abruptly swollen at the base, glabrous, smooth, concolorous, solid, 2–3 cm. long, 2–3 mm. thick.

This species may be found in late summer among grass in the open pine lands of western Cuba, attached to old grass roots.

Type collected at Herradura in August, 1907, *F. S. Earle 574.* Also collected in the same locality in 1910, *Britton & Earle 6533,* and at Pinar del Rio, *N. L. Britton & E. G. Britton & C. S. Gager 7228.*

10. LENTINUS SCYPHOIDES Pat. Bull. Soc. Myc. Fr. **15**: 195. 1899

Known only from the two collections of Duss in Guadeloupe. Specimens at Berlin are much discolored, but those in Patouillard's herbarium are in excellent condition. This species is quite distinct from *L. subscyphoides,* according to Patouillard.

11. **Lentinus subscyphoides** sp. nov.

Pileus very thin, nearly regular, funnel-shaped, 2–4 cm. broad; surface smooth, glabrous, avellaneous tinged with russet or fuliginous when young, becoming isabelline at maturity; margin involute, concolorous, glabrous: context thin, tough, rigid on drying; lamellae lilac when young, changing to isabelline, narrow, crowded, unequal, decurrent, a few of them bifurcate at the base, edges entire: spores ovoid, smooth, hyaline, 3.5 × 2.5 μ: stipe long, slender, slightly enlarged above and below, cinereous, pruinose, 2–3.5 cm. long, 1.5–2.5 mm. thick.

This species occurs from sea level to 1,500 feet elevation on the north shore of Jamaica, where I have studied it. Patouillard has specimens of it in his herbarium labeled *L. fuligineus* Berk. & Curt., which is a different plant, although the brief description agrees fairly well. *L. scyphoides* Pat. is closely related in form and microscopic characters, but is only one third as large.

Type collected at Moore Town, Jamaica, on dead sticks in dense woods, December 16, 1908, *W. A. & Edna L. Murrill 155.* Also collected in cocoanut plantations near Manchioneal, Jamaica, *W. A. & Edna L. Murrill 191, 194;* near Moneague, Jamaica, *W. A. & Edna L. Murrill 1130;* Martinique, *Duss 1849;* and British Honduras, *M. E. Peck.*

12. LENTINUS VELUTINUS Fries, Linnaea **5**: 510. 1830

*Panus velutinus* Fries, Epicr. Myc. 398. 1838.

*Lentinus ciliatus* Lév. Ann. Sc. Nat. III. **5**: 175. 1844. (Type from the Molucca Islands.)

*Lentinus setiger* Lév. Ann. Sc. Nat. III. **5**: 176. 1844. (Type from the Philippine Islands.)

*?Lentinus caelopus* Lév. Ann. Sci. Nat. III. **5**: 116. 1846. (Type from the United States.)

*Lentinus echinopus* Lév. Ann. Sci. Nat. III. **5**: 118. 1846. (Type from Java.)

*Lentinus siparius* Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868. (Type from Cuba.)

*Lentinus blepharodes* Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868. (Type from Cuba.)

*Lentinus (Scleroma) fallax* Speg. Anal. Soc. Ci. Argent. **16**: 274. 1883. (Type from Brazil.)

*Lentinus castaneus* Ell. & Macbr. Bull. Iowa. Lab. Nat. Hist. **3**: 194. 1896. (Type from Nicaragua.)

*Pocillaria cinnamomea* Earle, Inform. An. Estaç. Centr. Agron. Cuba **1**: 231. 1906. (Type from Cuba.)

This distinct and striking species was first described from Brazil, in 1830, but it has since received many names, partially listed above, from various parts of the tropical world, where it occurs in great abundance. In tropical North America, there is only one species of the general type, and names have been assigned to variations in size, length of stipe, color, and the condition of the velvety covering due to age; in oriental tropical regions, however, there are many near relatives more or less distinct from our species, of which the following are good examples: *L. holopogonius* Berk., *L. fuscopurpureus* Kalchb., *L. Hookerianus* Berk., *L. nepalensis* Berk., *L. similis* Berk., *L. fastuosus* Lév., *L. fasciatus* Berk., and *L. zonatus* Lév. Its wide distribution in America, from the lowlands of Florida and Mexico to the subtemperate regions of South America, may be realized from the fact that it occurs in practically every locality within this range where botanical explorations have been made.

### DOUBTFUL SPECIES

*Lentinus furfurosus* Fries, Epicr. Myc. 391. 1838. Based on *Agaricus omphalomorphus* Mont. from Chile. Specimens from Chile sent to Fries by Montagne are still at Upsala, but none so labeled were found from Costa Rica.

*Lentinus glabratus* Mont. Pl. Cell. Cuba 424. 1842. Type specimens at Paris collected by Sagra in Cuba very much resemble *Lentinula detonsa,* but differ in having decurrent gills and brown, marginal hairs. It is just possible that the two species have been confused, since a specimen at Kew sent by Montagne as *Lentinus glabratus* seems referable rather to *Lentinula detonsa.*

*Lentinus chaetoloma* Fries, Nova Symb. 34. 1851. Described from Oersted's collections in Costa Rica. Fries does not mention a figure, and no specimens were found. It is probably a thin, almost denuded form of *L. crinitus.*

*Pocillaria reflexa* Earle, Inform. An. Estaç. Centr. Agron. Cuba 1: 231. 1906. Type collected in Cuba by Earle and Wilson in 1904. A small, infundibuliform plant with very narrow gills, evidently closely related to *L. crinitus;* but authentic material has not been seen.

NEW YORK BOTANICAL GARDEN

# A NEW HOST FOR CLAVICEPS

HERBERT GROH

While making an examination of a quantity of wild hay received from Beauce County, in the province of Quebec, Canada, in December, 1909, I discovered that occasional spikes of a *Carex*, which constituted a large part of the hay, contained sclerotia of *Claviceps*. Suspecting this to be an exceptional host for the fungus, I made a search of the literature on the subject, with the result that I was unable to discover any record of a similar occurrence. Attempts were made to study the germination of the sclerotia, with a view to observing their further development, but, unfortunately, without success. The specimens were kept on moist, sterile sand in a Petri dish under ordinary living-room conditions of temperature, but, even after a lapse of several months, they had failed to develop stromata. Nothing is known of the history of the hay with which they had been gathered, and I have no doubt that age or the conditions of storage had influenced their power of germination. As no prospect remains now of gaining any more information about this interesting species, it seems advisable to put on record at least the fact of its discovery on *Carex*.

The sedge on which the sclerotia were found was identified as *Carex stellulata* Good. var. *angustata* Carey. Other Cyperaceae, including a number of other species of *Carex*, *Scirpus* and *Eriophorum*, and also a number of agricultural and wild grasses, were present, but on none of these were any sclerotia observed.

The appearance of the sclerotia *in situ* is shown in the accompanying drawing of representative specimens. Both macroscopically and microscopically, they are not unlike those occurring on grasses, and are undoubtedly *Claviceps* sclerotia. Their size varies from scarcely larger than the healthy perigynia to 5 mm. or more in length. Many of the smaller specimens appear to retain the features of the displaced perigynia at their tips.

With only this single stage of the fungus known, it is, of course, impossible to reach any conclusion as to its specific posi-

tion. It is not unlikely that it may be related to *Claviceps nigricans* Tul. occurring on *Eleocharis* and *Scirpus*, which are, I believe, the only members of the Cyperaceae at present recorded as being attacked by *Claviceps*. In this connection, mention may be made of a fungus described by Griffiths in the *Bulletin of the*

FIG. 1. Sclerotia of *Claviceps* on *Carex stellulata angustata*. × ⅔.

*Torrey Botanical Club*, Vol. 29, p. 300, and referred doubtfully to *Claviceps*. The sclerotial bodies there described were found, not on the reproductive organs, but inside the culms of the host, which was *Carex nebraskensis* Dewey. Through the courtesy of Dr. Griffiths I have been enabled to examine his specimens, which I find are clearly distinct from the ones under consideration here. They proved to be *Sclerotium sulcatum* Desm. (Ann. Sci. Nat. III. **16**: 329. 1851), with the conidial stage *Epidochium ambiens* Desm. (See Brefeld, Mycol. Unters. **10**: 317). The detached sclerotia of the fungus certainly resemble ergot grains very closely. The fungus of Dr. Griffiths was kindly determined by Mr. H. T. Güssow, Dominion Botanist.

# A NEW GENUS OF MYXOMYCETES?

THOMAS H. MACBRIDE

(WITH PLATE 36, CONTAINING 7 FIGURES)

This following description and accompanying figures are submitted to mycologists partly for the sake of eliciting information. The author has had the material for some years but has been unable in any way, either through the literature at hand or through correspondence, to secure light as to its relationships.

The specimens look like those of a slime-mould, but the spores have so far refused to grow. If a slime-mould, the species is referable to the family Dianemeae and is akin to those in which the capillitial threads pass from side to side of the fructification, attached at each end.

The entire structure is set forth more or less diagrammatically in the accompanying plate, the drawings for which are by Miss Irma Uhde.

**Schenella** gen. nov.

Fructification aethalioid, depressed, flat, covered by a fragile but continuous crust: capillitium of simple threads twisted together to form vertical columns passing from the hypothallus to the outer peridium as if supporting it, but closely arranged; spores abundant, between the columns.

**Schenella simplex** sp. nov.

Fructification white, oval, about $2 \times 4$ cm. in extent and about 3 mm. thick: capillitium abundant, dark-brown, exposed by the breaking up of the crust-like peridium, and, when this is removed, having the appearance of a colony of *Stemonitis*, each column being made up of a number of smooth, tubular, unsegmented threads twisted together so as to form a cord, and, in some instances, covered in whole or in part by a delicate common sheath: spores spherical, smooth, 5–6 $\mu$.

Type collected in August, 1903, on a decaying pine log in the Yosemite Valley, California, *T. H. Macbride.*

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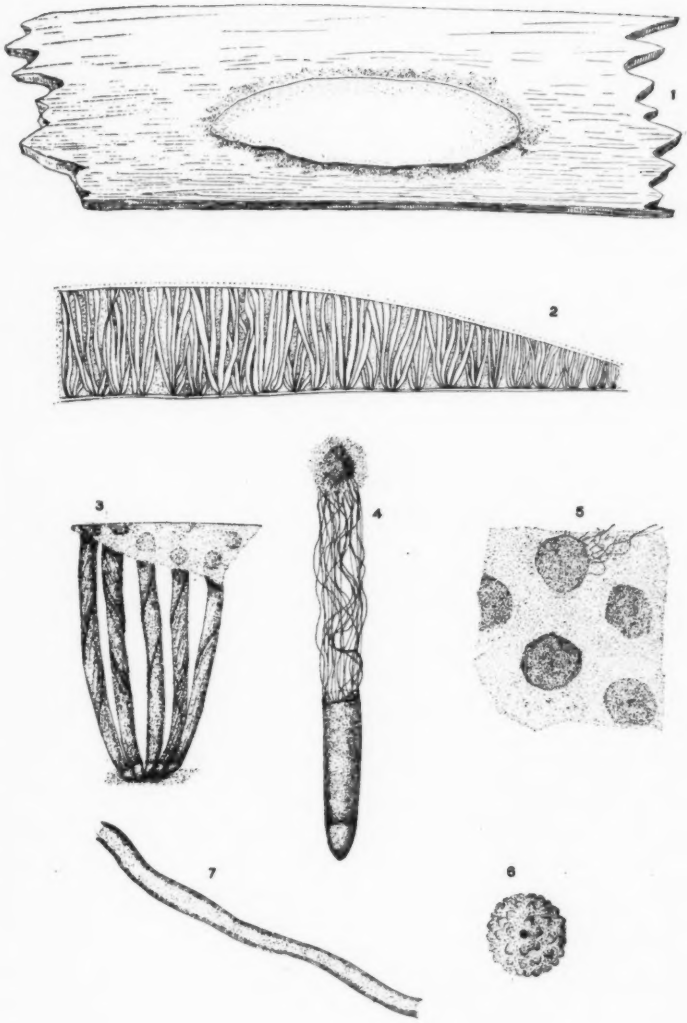
EXPLANATION OF PLATE 36

1. A single plant. × 5.
2. Section showing the columns of the capillitium supporting the peridium.
3. A small portion of the peridium with the supporting capillitial columns, more highly magnified.
4. A single column showing the component threads. × 30.
5. A portion of the peridium. × 40.
6. A spore. × 5000.
7. A portion of one of the component threads. × 3000.




SCHENELLA SIMPLEX MACBRIDE

## NEWS AND NOTES

Professor Bessey has recently estimated the number of species of plants to be about 210,000, of which over 60,000 are fungi.

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Mr. L. H. Pennington, instructor at Northwestern University, has been appointed assistant professor of botany at Syracuse University.

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A practising physician in Switzerland recently treated a patient who was badly poisoned by eating *Clitocybe geotropa.*

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Authors publishing new species in MYCOLOGIA are requested to donate, if possible, specimens or fragments of these species to the New York Botanical Garden.

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The mushroom market at Lausanne, Switzerland, opening May 1 and closing December 1, contained during the season of 1909 a total of 106 species, of which 15 were poisonous.

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An interesting polypore recently described by Schestunoff in *Hedwigia* as *Bresadolia caucasica,* has been found by Magnus to be only a monstrous form of *Polyporus squamosus* (Huds.) Fries.

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*Scleroderma Geaster,* described and figured in the January number of this journal for 1910, suddenly appeared in great quantities last September on a lawn at Shelter Island, practically covering the ground in many places and destroying most of the grass.

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Chemical tests have been employed by the French mycologists Maire and Potron in distinguishing certain species of *Russula.* The pigment is dissolved in boiling water and the effect of acetic acid on the colored solution noted (Bull. Soc. Myc. Fr. **26**: 327).

Dr. B. F. Lutman, of the Vermont Agricultural Experiment Station, visited the Garden on January 3.

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Mr. Lars Romell, of Stockholm, Sweden, an authority on fleshy fungi, some time ago made a personal test of the poisonous properties of fresh plants of *Entoloma lividum,* with almost fatal results. He followed this up with a plant of *Amanita muscaria* which had been boiled five minutes in water, and the effect on his system was not noticeable. Such experiments should be made with great caution.

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The "Shiitake," an edible mushroom cultivated for centuries in Japan on decaying trunks of oak and hornbeam sprinkled at intervals with rice water, has been found to have several scientific names. Specimens obtained from shops in Japan by the Challenger Expedition in 1875 were named *Agaricus* (*Armillaria*) *edodes* by Berkeley (Jour. Linn. Soc. Bot. **16**: 50. 1878), this being the first name applied and the best classification of the species. Specimens obtained in Japan in 1873 were assigned a herbarium name, *Agaricus* (*Pleurotus*) *russaticeps,* by Berkeley, which was published by Cooke (Grevillea **16**: 106. 1888) ten years after *A. edodes* was published. Schröter, in *Gartenflora* for 1886, described the same species from dried material as *Collybia Shiitake;* while Hennings, on receiving alcoholic specimens from Shirai, discovered a veil in the younger sporophores and transferred it to the genus *Cortinellus,* changing the name to *Cortinellus Shiitake* (Schröt.) P. Henn. Excellent specimens have been sent to the Garden by Professor Kusano, of Tokyo, during the past year, and others have been bought in the Chinese shops of New York City. The species is a good *Armillaria,* but it resembles *Marasmius* both in appearance and habit of growth.

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At the recent Minneapolis Meeting, Dr. C. E. Bessey, Professor of Botany of the University of Nebraska, was elected President of the American Association for the coming year; Dr. F. C. Newcombe, of the University of Michigan, was elected Vice-president of Section G; and Dr. W. G. Farlow, of Harvard Uni-

versity, was elected President of the Botanical Society of America.

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Mr. F. J. Veihmeyer, of the Bureau of Plant Industry at Washington, spent several days at the Garden during the holidays, consulting the collections of fungi made by Langlois, Calkins, and others.

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In the *Botanical Gazette* for November, 1910, Miss R. H. Lovejoy describes a new genus, *Catathelasma,* and six new species of hymenomycetes collected in the Medicine Bow National Forest, in the Rocky Mountain region of Wyoming. Miss Lovejoy promises to continue her collections in this new and interesting region.

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The Fungi of Chile have recently been treated by Spegazzini in a work containing 205 pages and 129 text figures. Of the 326 species and varieties listed, 121 are pyrenomycetes, of which 105 are described as new, and 35 are discomycetes, of which 24 are new. The small number of hymenomycetes, only 15, indicates the almost total lack of information regarding this large and important group.

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Volume 3, part 1, of *North American Flora,* comprising 88 pages of text, appeared December 29, 1910. It contains the order Hypocreales, with the families Nectriaceae and Hypocreaceae, by Fred J. Seaver; and the Fimetariales, with the Chaetomiaceae, by Helen L. Palliser, and the Fimetariaceae (Sordariaceae), by David Griffiths and Fred J. Seaver. Some of the species here treated, especially those belonging to the genus *Nectria,* are injurious to cultivated plants, while many of the species of *Cordyceps* live upon and aid in destroying injurious insects.

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A number of new species of fungi were recently descibed by Dr. Chas. F. Fairman (Ann. Myc. **8**: 322–332. 1910) under the title "*Fungi Lyndonvillenses novi vel minus cogniti.*"

Dr. C. L. Shear has, upon request, kindly contributed the following note regarding the meeting of the American Phytopathological Society at Minneapolis.

The meeting of the phytopathologists was very well attended. The following officers were elected: President, Professor A. D. Selby, Wooster, Ohio; Vice-president, Dr. R. A. Harper, University of Wisconsin; Secretary-Treasurer, Dr. C. L. Shear; Councilmen: Dr. G. P. Clinton and Dr. Erwin F. Smith. The President of the Society, and the Chairman of the Board of Editors, Dr. L. R. Jones, are members *ex officio* of the Council.

The Society approved the recommendation of the Council to publish a Journal to be known as "*Phytopathology.*" The first number will appear February 1. The following editorial board was appointed:

Editors: L. R. Jones, C. L. Shear, H. H. Whetzel.

Associate Editors: G. P. Clinton, E. W. Freeman, H. T. Güssow, F. D. Heald, Haven Metcalf, W. A. Orton, W. M. Scott, A. D. Selby, Erwin F. Smith, Ralph E. Smith, F. L. Stevens, L. M. Thaxter.

Business Manager: Donald Reddick.

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Stevens and Hall have described (Bot. Gaz. **50**: 460–463. 1910) three new species of *Claviceps,* as follows: *Claviceps Paspali, Claviceps Rolfsii,* and *Claviceps Tripsaci.* The first two occur on species of *Paspalum* and differ in the length of stipe and in the size of the perithecia, asci, and spores. Both are associated with what has been known as *Sclerotium Paspali* Schw., two species probably having been included under the same name. *Claviceps Tripsaci* occurs on *Tripsacum dactyloides* L.